UNITED STATES v. CARL DRESSELHAUS ET AL.

IBLA 82-88 Decided June 8, 1984

Appeal from decision of Administrative Law Judge L. K. Luoma, declaring certain mining and millsite claims invalid. Contest CA-4992.

Affirmed in part; reversed in part.

1. Evidence: Prima Facie Case -- Mining Claims: Contests
When the Government contests a mining claim on a charge of lack of discovery of a valuable mineral deposit, it has the burden of going forward with sufficient evidence to establish a prima facie case. Where a Government mineral examiner testifies that he has examined a claim and found the quality of the minerals insufficient to support a finding of discovery based on conventional methods of mining, a prima facie case is established. A contestee may overcome the prima facie case by probative evidence that a person of ordinary prudence would be justified in the further expenditure of his labor and means with a reasonable prospect of success in developing the quality and quantity of minerals found by specialized mining methods.

2. Mining Claims: Determination of Validity -- Mining Claims: Discovery: Geologic Inference

Where a mineral claimant has located a group of claims, he must show a discovery on each claim. Geologic inference alone may not be used to show the existence of a mineral deposit; there must be an exposure of minerals of value.

APPEARANCES: James A. Pascarella, Esq., and Thomas A. Illmensee, Esq., Garden City, New York, for contestee-appellant Coso Corporation; Carl Dresselhaus, Esq., pro se, and for contestee-appellant Virginia Troeger; James E. Turner, Esq., Office of the Solicitor, Pacific Southwest Region, Department of the Interior, for Bureau of Land Management.

OPINION BY CHIEF ADMINISTRATIVE JUDGE HORTON

In response to a request from the National Park Service (NPS), the California State Office, Bureau of Land Management (BLM), issued contest

complaint CA-4992 on April 21, 1978, against Carl Dresselhaus and Virginia Troeger, owners of 31 contiguous lode mining claims and 2 millsite claims located within the boundaries of Death Valley National Monument. With respect to each mining claim, the complaint charged that "[t]here are not presently disclosed within the boundaries of the mining claim minerals of a variety subject to the mining laws, sufficient in quantity, quality, and value to constitute a discovery." As to the millsite claims, the complaint alleged that "[t]he land is not being used or occupied for mining or milling purposes."

Contestees timely responded denying the charges and reporting that Bell Mountain Silver Mines, Incorporated (Bell Mountain), and Coso Corporation (Coso) were interested parties by virtue of their being lessees of the claims with an option to purchase. Coso also filed a petition to intervene and an answer to the complaint denying the charges.

On June 14, 1978, BLM issued an amended complaint adding Bell Mountain and Coso as contestees.

A hearing was held before Administrative Law Judge L. K. Luoma from June 5 through 7, 1979, in Las Vegas, Nevada, and October 30 through November 4, 1979, in Reno, Nevada. 1/

The claims are situated within the boundaries of Death Valley National Monument in protracted secs. 24, 25, and 35, T. 17 S., R. 44 E.; protracted secs. 19 and 30, T. 17 S., R. 45 E.; and protracted sec. 28, T. 19 S., R. 44 E., Mount Diablo meridian, and all were located long before the closure of the monument to mining on September 28, 1976, by section 3 of the Mining in the Parks Act, 90 Stat. 1342. The claims are known collectively as the Del Norte Group (Del Norte Nos. 1 through 5, Del Norte Fraction, Inyo Lode and Inyo Nos. 1 through 3 lode mining claims, and the Del Norte millsite) and the Skidoo group (Silver Ball, Silver Ball Nos. 1 through 11, Gold Rock, and Gold Rock Nos. 1 through 7 lode mining claims, and the Gold Bottom millsite).

The claims have a history of intermittent, although at times quite profitable mining operations between 1906 and 1952. See generally II Tr. 85-90; Exhs. G-12 through 15, C-14. Contestee Dresselhaus did small-scale mining of the claims in 1954 and the 1960's (II Tr. 1034; I Tr. 36-38, 64-69). The Del Norte group is the site of a massive tabular quartz vein with a 10 degrees dip. The overburden has eroded exposing the vein on the surface and sides (II Tr. 101). The Skidoo claims contain a system of underground quartz veins that vary in width but average 2 feet. The veins of one system strike northwest and dip steeply to the southwest; those of the other system strike east-west and dip steeply to the north (Exh. C-14).

In 1971, lessees of the claims initiated a drilling project financed, in part, by Geological Survey's Office of Minerals Exploration (OME) under its OME loan program to investigate the value and extent of the gold deposits remaining on the Del Norte group (Exh. G-1). The exploration program was

1/ References from the June hearing transcript will be identified by "I" and to the October-November hearing transcript by "II." The exhibits are identified by G for BLM and C for Coso.

terminated in 1972 after a determination that the sampled gold deposits were found to be insufficient to justify further work (Exh. G-1, Unit 8). 2/ While the OME project was still in progress, James Keighley and Dr. H. R. Cooke, mining and exploration geologists, investigated the claims for Bell Mountain. They were particularly interested in applying cyanide heap leaching for extraction of precious metals from low-grade gold and silver ores (II Tr. 25-28). Bell Mountain leased the claims on Keighley and Cooke's recommendation and more extensive sampling was done, first by Cooke and later by Robin E. Hendrickson, also a mining geologist (II Tr. 30, 352, 387-88). In 1974, Coso became involved with the claims by assignment of Bell Mountain's lease (II Tr. 352-55). A heap leaching plant was designed in 1974 and built on the Inyo No. 1 claim in 1975 (II Tr. 406; Exh. C-34). Preparation for onsite heap leach testing was begun but actual onsite testing was never conducted. The operation shut down in December 1975 because of weather and management problems, although Coso intended to resume operations the next spring. Coso elected not to resume operations in 1976 because of uncertainty arising from the legislation nearing passage that would close Death Valley National Monument to mining (II Tr. 356-69, 503-13).

At the hearing, the Government first called Carl Dresselhaus (I Tr. 33-106) and then three expert witnesses: David Jones, Chief, Division of Mining and Minerals, NPS (I Tr. 107-315); Robert Mitcham, mineral advisor to the Superintendent, Death Valley National Monument (I Tr. 320-808); and L. S. Zentner, Chief, Division of Mining and Minerals, Western Region, NPS (II Tr. 72-346). In addition to Keighley (II Tr. 16-72) and Hendrickson (II Tr. 382-735), contestees called Davis R. Chant, officer and shareholder of Coso (II Tr. 350-75); Derrel W. Houdashelt, physical scientist and mining consultant dealing primarily in technical matters relating to recovery of precious metals (II Tr. 740-85); Donald Fife, senior mining geologist with a large domestic consulting firm (II Tr. 786-849); and Daniel W. Kappes, mining engineer and partner in his own mining consulting firm (II Tr. 850-1032). Dresselhaus also testified on his own behalf as one of the owners of the claims (II Tr. 1034-55).

By decision dated September 23, 1981, Judge Luoma found heap leaching to be an acceptable method for the extraction of gold and silver which could be economically applied to the quality and quantity of gold and silver found on the Del Norte No. 5, Del Norte Fraction, and Inyo No. 1 mining claims. He found all of the other mining claims and the two millsite claims to be invalid.

Coso, Dresselhaus, and Troeger, appellants herein, appealed the decision as to the claims declared invalid. Appellants state that Judge Luoma's findings of fact with respect to tonnage and grade of the ore in the claims,

2/ The OME project was terminated without completion of Phase II of the program. The drilling in Phase I did disclose sufficient mineralization to warrant the certification of the disclosure of valuable mineral. The "certification letter" stated that "the Government hereby certifies that mineral or metal production may be possible as a result of the exploration work" (Exh. G-1, Unit 9). The effect of this certification was to encumber the property for 10 years with a production royalty to be paid until return of the loaned amount plus interest.

effectiveness of the cyanide heap leaching operation, and the costs of mining the claims agreed with virtually all of appellants' factual assertions. Appellants contend, however, that Judge Luoma's conclusions are erroneous in view of those findings of fact. Specifically, appellants urge that the conclusion that the Government had made a prima facie case is erroneous because it was predicated upon the Government's examination of the claims failing to disclose that there are valuable mineral deposits on the claims that can be extracted and mined at a profit utilizing conventional mining and milling processes. According to appellants, this is inconsistent with the Judge's findings that the Government did not show that heap leaching on the claims is not economically viable and that cyanide heap leaching is an acceptable processing method which could be economically applied to the gold and silver deposits at issue. Appellants next argue that the Inyo Lode, Inyo No. 2, Del Norte, and Del Norte No. 3 claims are valid because, as Judge Luoma found, there is a massive and continuous quartz lode vein extending over these claims as well as the claims he declared valid (Decision at 10). Appellants contend that there is no evidence in the record contradicting the testimony of their experts that economic quantities of gold and silver ore exist on all of the Del Norte claims and that some of the deposits on each could be mined at a profit.

Appellants also urge that the Silver Ball Nos. 7 through 10 mining claims should also have been declared valid. Appellants note that the Judge found that there are at least 21,000 tons of ore on these claims containing 0.3 ounces of gold per ton and that the cost of mining, crushing, and leaching the ore at the relevant time was $20 per ton. Using the same analysis as Judge Luoma, appellants claim that the value of the ore in gold recovered would have been $24.57 per ounce on the date of withdrawal. 3/ Appellants thus conclude that mining these claims would be economically feasible, particularly when one recognizes that the silver content of the ore would bring additional profit per ton. Appellants incorporate by reference their arguments in their Post-Trial Memorandum of Points and Authorities dated June 4, 1980 (hereinafter Post-trial brief), thereby also raising on appeal the assertion that they overcame the Government's prima facie case with respect to the Silver Ball, Silver Ball No. 5, and Silver Ball No. 11 claims (Post-trial brief at 10).

In response, BLM urges that Judge Luoma's decision be affirmed incorporating its posthearing arguments. In particular, BLM urges that it established a prima facie case against the claims by the testimony of its mineral examiners to the effect that they examined each claim and found no evidence of a discovery of a valuable mineral. 4/ BLM notes that no evidence was

3/ Appellants' value is based upon an average grade ore of 0.3 ounces per ton and a cyanidation recovery of 70 percent of the contained gold at a price of gold of $117 per ounce.

4/ The mineral examiners' testimony was based almost entirely upon data presented to them by the contestees. While they did traverse each of the claims and take a limited number of samples, the samples were taken to confirm the results obtained by the contestees. Little concrete evidence with respect to the cost of mining and treating the ores was presented in the Government case

presented as to use of the two millsites for mining or milling purposes in connection with any of the mining claims and therefore the millsite claims were properly held to be invalid. BLM points out that the testimony of appellants' witnesses does not support a finding that the mineral deposit on the Del Norte group extends to all of the claims and that the evidence as to the grade of the mineral does not support a conclusion that a valuable mineral has been discovered. As to the Skidoo group, BLM argues that each claim must be evaluated independently and that appellants' evidence reveals that these claims would have to be mined in conjunction with the Del Norte group to be profitable.

A discovery of valuable minerals under Federal mining laws exists only where the minerals found are of such a character that a person of ordinary prudence would be justified in further expenditure of his labor and means with a reasonable prospect of success in developing a valuable mine. United States v. Coleman, 390 U.S. 599 (1968); Chrisman v. Miller, 197 U.S. 313 (1905); Castle v. Womble, 19 L.D. 455, 457 (1894). This "prudent man test" has been refined to require a showing of marketability; that is, a showing that the mineral in question can be presently extracted, removed, and marketed at a profit. United States v. Coleman, supra.

Where the land is closed to location under the mining laws subsequent to the location of the mining claim, as in the present case, the claim must be supported by discovery at the time of the withdrawal. Cameron v. United States, 252 U.S. 450 (1920); Clear Gravel Enterprises v. Keil, 505 F.2d 180 (9th Cir. 1974); United States v. Netherlin, 38 IBLA 86 (1977).

When the Government contests the validity of a mining claim for lack of a discovery of a valuable mineral deposit, the ultimate burden of proof is upon the mining claimant. The Government, however, bears the initial burden of going forward with sufficient evidence to establish a prima facie case that no discovery of a valuable mineral deposit has been made. Foster v. Seaton, 271 F.2d 836 (D.C. Cir. 1959); United States v. Bechthold, 25 IBLA 77 (1976); United States v. Taylor, 19 IBLA 9, 82 I.D. 68 (1975).

Once the Government has established a prima facie case that the claim is not supported by a discovery, the burden of going forward then shifts to the contestee who must overcome the Government's case by a preponderance of the evidence. Humboldt Placer Mining Co. v. Secretary of the Interior, 549 F.2d 622 (9th Cir.), cert. denied, 434 U.S. 836 (1977); United States v. Springer, 491 F.2d 239, 242 (9th Cir.), cert. denied, 419 U.S. 834 (1974); Foster v. Seaton, supra; United States v. Harris, 38 IBLA 137 (1978).

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fn. 4 (continued)
and the primary thrust of its economic presentation was directed to the availability of water for the treatment of the ores. As later discussed, the Board accepts the evidence presented by appellants (contestees below) with respect to the nature of the mineralization on the property and the cost of mining and treatment of this mineralization.

[1] The first issue raised by appellants is whether the Government established its prima facie case. 5/ The well-established rule is that the Government establishes a prima facie case when a mineral examiner testifies that he has examined a claim and found the mineral values insufficient to support a finding of discovery. United States v. Knecht, 39 IBLA 8 (1979); United States v. Bechthold, supra; United States v. Winters, 2 IBLA 329, 78 I.D. 193 (1971). Even if the Government merely shows that one essential criterion of the discovery test was not met, it has established a prima facie case as to that criterion. See United States v. Hooker, 48 IBLA 22 (1980); United States v. Taylor, supra at 28, 82 I.D. at 75. In such a case, the contestee need only preponderate on that one issue, and matters not placed in issue by the Government case need not be disproved by the claimant. United States v. Cactus Mines Limited, 79 IBLA 20 (1984).

In his decision, Judge Luoma summarized the Government's case as follows:

> Contestant presented three mining engineers who each testified that the mineral deposits on each of the Del Norte and Skidoo group claims were of insufficient quality, quantity, and marketability to constitute a discovery. Mr. L. S. Zentner, Chief of the Division of Mining and Minerals for the Western Region of the National Park Service, testified that he had personally visited and examined all of the Del Norte and Skidoo group claims at some time during his 25 or more visits to the claim area since 1972 (II Tr. 72, 103, 214). Since 1972 the contestees worked only the Del Norte; Inyo No. 1; Del Norte Fraction; and Del Norte No. 5 claims and they sampled some of the Skidoo group claims (II Tr. 83). He testified that any commercially profitable gold deposits that may have been on the Skidoo group claims had already been removed (II Tr. 99), and that only the first few feet in depth of the host rock on the Del Norte group claims contained any possible gold deposits of commercial value (II Tr. 99). Therefore, he concluded that conventional mining and milling of the contested claims would be unprofitable (II Tr. 141, 157), and even if available water could be found and transported to the site for a heap leaching operation (II Tr. 118), the costs of such an operation would greatly exceed any possible recovery from the sale of the extracted gold at 1976 prices (II Tr. 179).
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> Since 1972, according to Mr. Zentner, neither of the contested millsites has been used for mining or milling purposes (I Tr. 411 and II Tr. 1975), but the Gold Bottom millsite has some tanks, an old building and a stamp, but not a mill or quartz reduction works (II Tr. 177).

(Decision at 3).

5/ With respect to the Del Norte No. 1, Del Norte No. 2, Del Norte No. 4, Inyo No. 3, Silver Ball No. 3, Silver Ball No. 4, Silver Ball No. 6, and the Gold Rock claims appellants merely contend that the Government did not establish a prima facie case at the hearing (Statement of Reasons at 2; Posthearing brief at 10). No evidence was presented by contestees at the hearing to overcome the Government's alleged prima facie case as to these claims.

Judge Luoma concluded that a prima facie case had been established as to the mining claims based on Government witnesses' testimony that their examination of the claims failed to disclose valuable deposits of gold and silver that could be extracted and mined at a profit using conventional mining and milling processes (Decision at 12). We agree with Judge Luoma's determination that a prima facie case had been presented, and affirm his decision with respect to those 15 claims for which contestees presented no probative evidence concerning the existence of a discovery. 6/

Appellants complain that they do not intend to extract gold and silver from the mined ores in a "conventional manner"; rather, they plan to heap leach for the gold and silver. Appellants argue that it was error for a prima facie case to be founded upon the profitability of operations utilizing "conventional" extraction processes. 7/

We have long recognized that it is not the responsibility of the Government mineral examiners to do discovery work, to explore or sample beyond the claimant's workings, or to undertake the rehabilitation of alleged discovery cuts in order to make the prima facie case. United States v. Winters, supra. Similarly, we do not believe that a Government mineral examiner need base his prima facie case on all conceivable methods of mining and extraction of valuable minerals, or one specialized method. Here, the Government did not dispute the quality of the mineral found (II Tr. 97-99). Its case is based on its assessment that the value of the minerals found was not sufficient to result in profitable mining by conventional methods and therefore no discovery had been made (II Tr. 169). In presenting its case in this manner, the Government runs the risk that its prima facie case will be easily overcome by probative evidence that an alternative method of mining will satisfy the test for a discovery. See United States v. Williams, 65 IBLA 346 (1982). 8/

Appellants' burden of proof at the hearing was to show by a preponderance of evidence that the gold and silver on each claim could be successfully mined and extracted by conventional methods or by a technically sound alternative method -- in this case, heap leaching. Appellants made no attempt to preponderate on the issue of discovery where conventional mining and extraction methods are employed; indeed, appellants' witnesses, Hendrickson and Houdashelt, testified that the claims could not have been operated profitably using conventional mineral extraction methods in 1976 (II Tr. 732-33,

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6/ Viz., Del Norte No. 1, Del Norte No. 2, Del Norte No. 4, Inyo No. 3, Silver Ball No. 3, Silver Ball No. 4, Silver Ball No. 6, and the Gold Rock claims. See note 5.

7/ The terms "conventional" and "unconventional" were used by the parties to differentiate between the use of a flotation or vat leach plant for the beneficiation and/or extraction of the gold from the ores and the use of heap leaching. We do not agree that the use of heap leaching is an unconventional method for the extraction of gold and silver from mined rock. However, for the sake of convenience and clarity we will use the same terms used by the parties and Judge Luoma.

8/ In this case, the Government did present testimony on water problems involved in heap leaching the claims.

779). 9/ However, we agree with Judge Luoma that contestees met their burden with respect to the Del Norte Fraction, Del Norte No. 5, and Inyo No. 1 claims by showing by a preponderance of the evidence that heap leaching the gold on those claims would be profitable, and we affirm his decision with respect to those claims.

With respect to the millsite claims, as Judge Luoma indicated, the Government established its prima facia case when Zentner testified that the millsites were not being used for mining and milling purposes as required by 30 U.S.C. § 42 (1982). There was no evidence presented by the contestees at the hearing contradicting that testimony. 10/ Accordingly, we affirm Judge Luoma's finding that the two millsite claims are invalid. See United States v. Osmer, 76 IBLA 59 (1983).

We turn to the remaining 13 lode mining claims at issue on appeal. Appellants state that they agree with Judge Luoma's summary of the evidence at the hearing but disagree with his conclusions as to the validity of the Del Norte, Del Norte No. 3, Inyo Lode, Inyo No. 2, Silver Ball, Silver Ball No. 1, Silver Ball No. 2, Silver Ball No. 5, Silver Ball No. 7, Silver Ball No. 8, Silver Ball No. 9, Silver Ball No. 10, and Silver Ball No. 11 lode mining claims. Since the feasibility of heap leaching is not at issue on appeal, we will set out below that portion of the Judge's summary of the evidence dealing with the quality and quantity of the minerals on the claims and the overall cost of extraction and heap leaching:

> The Office of Minerals Exploration, Geological Survey, United States Department of the Interior, provided a financial assistance loan in connection with exploration work on the Del Norte group (Exh. G-1). The Governmental funds obtained were used to drill some 54 test drill holes and for assaying samples. Results of fire assays of samples taken from 54 drill holes indicated an average grade of .02 ounces of gold per ton and .03 ounces of silver per ton of ore.
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> The Department of the Interior geologist, who had responsibility for the project and who prepared the final field report, noted discrepancies between drill hole results and assays from bulk samples. He believed it was probably attributable to faulty sampling and preparation of them for fire assaying (in regard to the drill hole samples).
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> On the basis of the drill holes themselves two "ore shoots" were indicated -- one in the central area of the Del Norte

9/ Since the contestees went forward with their case, even if the Government had failed to make a satisfactory prima facie case of no discovery, the evidence presented by the contestees which supported the Government's contest charges could be used against the contestees, regardless of any defects in the Government's case. United States v. Arizona Mining and Refining Co., 27 IBLA 99 (1976); United States v. Taylor, supra.

10/ In fact, none of the witnesses for the contestees could identify the location of the millsites.

vein containing 329,000 tons of ore, with an average value of more than .1 ounces of gold per ton and .18 ounces of silver per ton. The other ore shoot was in the west end of the Del Norte vein with approximately 225,000 tons of ore with .20 ounces of gold per ton and .39 ounces of silver per ton. The geologist concluded that future production was feasible with gold at a price of $50 per ounce if water could be obtained for use in milling (Exh. G-1).

Contestees undertook a detailed sampling of the Del Norte claims. Samples were taken from six of the existing open pits on the Del Norte group claims and bulk samples were taken from four of the shafts on the property. About 6,500 pounds of material was taken as samples (II Tr. 420). The results of the testing of the pits and the shafts from the sampling showed what the contestees assert to be the average grade of gold in the main ore shoot on the Del Norte group, .167 ounces per ton (II Tr. 27-28, 416-417). The parallel vein underground in the Del Norte group was sampled and gold values were found that averaged better than .5 ounces per ton (II Tr. 502). The open pits and the four shafts sampled are on the Del Norte Fraction, Del Norte No. 5, and Inyo No. 2 (II Tr. 557, 562; Exhs. G-8, G-25; and Exh. C-34).

The next sampling conducted by the contestees consisted of channel sampling or trenching (II Tr. 417). Over 13,000 feet of trenches were sampled (Exh. C-34). The overall average for the trenches was .14 ounces of gold per ton and .24 ounces of silver per ton (II Tr. 434; Exh. C-21). The average grade for trenches later excavated was .102 ounces of gold per ton and .25 ounces of silver per ton (II Tr. 435; Exh. C-21).

Subsequently, contestees slab sampled shafts on the claims (II Tr. 461-462). Further assay results from samples taken from 194 blast holes drilled in the Del Norte No. 5 and Del Norte Fraction claims, from which the 5,000 tons of ore were removed for a pilot cyanide heap leach, showed a value of .143 ounces of gold per ton for these samples (II Tr. 524-525, 527-531; Exh. C-32).

* * * Mr. Keighley testified that he and Dr. H. R. Cooke first became aware of the Del Norte claims in 1971 when they were endeavoring to locate low grade gold and silver deposits. * * * [They] evaluated the results of an Office of Mineral Exploration drilling program conducted on Del Norte in 1971. They also took a number of bulk samples from existing pits located on Del Norte and took bulk slab samples from four of the existing shafts on Del Norte. It was the opinion of both Mr. Keighley and Dr. Cooke, even at a time when gold was sixty dollars an ounce, that the Del Norte vein was an exceptional commercial ore body containing substantial tonnage of disseminated low grade gold and silver ore (II Tr. 16-72).

The contestees also conducted an extensive sampling program on some of the Skidoo claims. They began a systematic

mapping and sampling program of the existing underground and surface workings on these claims. They surveyed various drifts, crosscuts and adits and made reconnaissance notes on the exposed veins, and then systematically sampled the veins, and these samples were fire assayed. In those areas which showed favorable results, additional sampling was done on five foot centers to more specifically determine the grade and tonnage in those areas. In excess of 200 samples were collected (II Tr. 478-79).

Mr. Robin E. Hendrickson, * * * blocked out ore in several areas in the Skidoo group. While he was not able to find his original calculations, he recalculated the tonnage and grade figures from the information which was still available to him which included various assay maps (some introduced into evidence by the Government) and assay report sheets. Mr. Hendrickson's recalculation showed 21,000 tons of ore in place with a value of .3 ounces of gold per ton. He recalled that his original calculations for these same areas showed 24,000 tons at .4 ounces of gold per ton.

Contestee Carl Dresselhaus had done some small-scale mining on the Skidoo claims. Mr. Dresselhaus testified that he obtained 27 ounces of gold from Silver Ball Nos. 2 and 8 in 1960, and that the values of the ore was .75 ounces of gold per ton (I Tr. 36-38, 64-69). In 1954 he obtained 42 ounces of gold from Silver Ball No. 2 with the ore having a grade of more than one ounce of gold per ton (I Tr. 78-84; II Tr. 1035-1036; D6). In addition, in doing assessment work, Mr. Dresselhaus found a vein on Silver Ball No. 7 that was approximately .5 ounces of gold per ton (II Tr. 1046).

Contestees' expert witnesses presented considerable evidence on the economics of mining the deposits using the cyanide heap leaching process for extraction. Generally, they concluded that the heap leaching process of extraction is a much less expensive method than traditional milling, that it is especially adaptable to low grade deposits such as here and that little stripping costs would be encountered on the Del Norte group because of the erosion of the overburden.

Mr. Hendrickson did a cost analysis to determine what the costs would have been for a continuous mining operation at Del Norte as of September 28, 1976. The same type of analysis was employed here, as earlier, but the figures were updated. Further, Mr. Hendrickson, from data generated during the pilot test heap leach program, was able to determine actual water cost. During that program, the contestees actually trucked 90,000 gallons to the pad area of the claims. Mr. Hendrickson, therefore, had "good calculations on how long it would take to get the water truck up there, what the cost of the water truck was per hour and the cost of the water per gallon" (II Tr. 602). He determined the cost of the water truck to be "$26.40 an hour, maintained and operated" including the driver.

Similarly, the drilling and blasting costs were updated and very accurate because, as of September 1976, Mr. Hendrickson had actual knowledge of the cost to drill blast holes on the property and shoot the material. This, again, had actually been done to obtain the 5,000 tons of ore from the claims which was put on the test heap pad. He also had experience with the crushing plant used in the test and knew what would be required for an ongoing mine. He determined the crushing cost to be $1.58 a ton. The total cost of water per ton (as of 1976) was $1.65, and this was based on a 60-day leach period. All that was really necessary, according to Mr. Hendrickson, was a pad cycle of about twenty to twenty-five days (II Tr. 601-603). Based on the above, Mr. Hendrickson determined (again, using a 60-day leach cycle to be conservative) that the actual cost to mine and heap leach the ore at Del Norte as of September 28, 1976, was $7.46 per ton of ore. This included crushing. Mr. Hendrickson felt if you did not crush the ore (and according to Kappes, run-of-mine material would have leached favorably), you would have had to leach for 60 days -- but this would result in eliminating crushing costs of $1.58 and, therefore, a total cost of $5.88 per ton of ore.

With the price of gold at approximately $117.00 an ounce, the value of the ore in gold recovered would have been $13.68 per ton of ore (using the average grade of the ore as .167 and a cyanidation recovery rate of 70 percent). Taking silver at a price of $4.35 an ounce, similarly, the recovered silver value would be 43.5 cents per ton of ore. (This assumes a 50 percent recovery rate of silver). The total recovered value of precious metals from the ore would be $14.11 per ton, yielding a profit of $6.65 per ton of ore (II Tr. 604-606). The rate of return on investment (assuming an investment of $200,000.00 and 200,000 tons of ore) would be better than six to one on that investment (II Tr. 607).

Similarly, Mr. Hendrickson testified to the cost of an ongoing mining operation at the Del Norte claims as of the date of the hearing (November 1979). His estimation was a total cost of $10.50 per ton of ore. At today's (and at the November 1979) price of gold, he believes the profit margin is staggering (II Tr. 608-609).

In working up a cost analysis for the Del Norte property, Mr. Kappes "reviewed previous costs which he paid for water trucks, for hauling water to heaps and the cost of quoted water truck prices and [he] allowed a hauling time of five hours . . ." (II Tr. 990). The actual figures were 1978 costs.

Mr. Kappes calculated the cost of a mining and heap leaching operation at Del Norte "based on employing contractors to do the mining work and to do the work of hauling water and applied to that figure contractors' costs which [he was] personally aware of from operations run in 1977 and 1978, and applied to that also, the general cost of chemicals, power, water, which [were] also based on [his] previous experience." The contracting included crushing costs. (II Tr. 991).

> In Exhibit C-60, Mr. Kappes set out the costs to be applied for 1976 and 1979 for mining and leaching at Del Norte. He concluded that as of September 28, 1976, the total costs, with crushing, would be $8.15 per ton. The total cost without crushing would be $6.59 per ton. These figures compare very closely with Mr. Hendrickson's, and Mr. Kappes admitted his figures were somewhat on the high side (II Tr. 991-996, 999). Cost of mining for Del Norte in 1979 was $10.69.
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> According to Mr. Hendrickson, the Skidoo Claims were cost-feasible (II Tr. 1000). The "high-grading" operation would entail using a "bobcat" (a variety of front-end loader) to bring the ore out from underground. The ore would then be brought to the heap leach pad and leached (II Tr. 615-616). Mr. Hendrickson calculated that "the total cost including mining, crushing and leaching would be about $20.00 per ton of ore" (II Tr. 616). The costs as of the time of the hearing would run between $28.00 to $30.00 per ton (II Tr. 619).
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> The record as a whole, and in particular the testimony of Messrs. Keighley, Hendrickson, and Kappes, indicates that there is a massive and continuous lode or quartz vein extending over the Inyo, Inyo 1, Inyo 2, Del Norte Fraction, Del Norte, Del Norte 3, and Del Norte 5 claims. The record shows that the vein is thoroughly exposed and can easily be removed by open pit mining. Both Mr. Hendrickson and Mr. Kappes testified that an economic quantity of gold and silver ore existed on all the claims containing the Del Norte vein and that, at least, some of the deposits on each would be mined. [Emphasis in original.]

(Decision at 6-10).

Appellant argue that Judge Luoma's findings as to the claims from the Del Norte group first mentioned are inconsistent with his final conclusion for the group which reads as follows:

> The pilot leach project has shown that gold can be recovered from the Del Norte deposit profitably. Revenues over leaching costs reveal a profit could be made that would encourage a prudent man to develop the claims. All the necessary equipment and materials were assembled on the claims. There were no problems encountered in leaching the ore and extracting gold from it. * * * The average ore grade in the Del Norte main ore shoot is .167 ounces of gold per ton. The cost of mining and leaching gold ore from the Del Norte group of claims would not make recovering the gold uneconomical. The ore is well fractured and readily crushable, therefore making it favorable to a heap leaching operation.
>
> Mr. Hendrickson made a cost analysis using September 28, 1976 prices. Actual cost to mine and heap leach Del Norte ore was $7.46 per ton in 1976. Eliminating crushing costs it would be $5.88 per ton in mining costs. Price of gold in 1976 was

> $117 per ounce. Value of gold recovered would be $13.68 per ton (using a .167 ounce of gold per ton grade and a cyanidation recovery rate of 70 per cent). Silver recovered would add 43.5 cents per ton (at a silver price of $4.35 an ounce). Total recovered precious metals would be $14.11 per ton. Using the higher mining cost figure of $7.46 per ton, a profit of $6.65 per ton of ore could be recouped. The mining claimants estimated a rate of return of better than six to one over capital investment. Such probabilities would encourage a person to develop these claims. Mining costs in 1979 would be $10.50 per ton. Even at 1976 gold prices a profit could be recouped. The price of gold was even higher at the time of the hearing in 1979. The cost analysis prepared by the contestees shows that some of the claims are worthy of developing. The contestees have submitted prepondering evidence to overcome the Government's prima facie case. However, the Del Norte vein or ore shoot is only on some of the claims.
>
> I find that the record establishes that there is a massive and continuous lode or quartz vein extending over some of the Del Norte group of claims. The vein is exposed and can be removed by open pit mining. Through a sampling program employing drilling, shaft sampling, pit-bulk sampling, and trenching, the contestee's experts were able to infer a block of ore containing about 200,000 tons with an average grade for gold of .167 ounces per ton, and silver .25 ounces per ton. This ore body is located on Inyo No. 1, the Del Norte Fraction and the Del Norte No. 5.

(Decision at 12-13).

From calculations based on the costs of mining and processing the ores, as found above, including the recovery rate, the cutoff grade can be determined for both the surface and underground ores. 11/ For surface operations on the Del Norte group of claims, the cutoff grade is 0.09 ounces of gold per ton. 12/ For underground workings, the cutoff grade is 0.25 ounces of gold per ton. 13/

We do not agree with appellants' contention that Judge Luoma's findings and conclusions regarding the Del Norte group of claims are inconsistent. He found, correctly, that a massive quartz vein extends over Inyo, Inyo No. 1, Inyo No. 2, Del Norte Fraction, Del Norte, Del Norte No. 3, and Del Norte

11/ "Cutoff grade" is defined as the lowest grade that will meet costs. Dictionary of Mining, Mineral, and Related Terms, U.S. Department of the Interior, 1968 Edition.

12/ For the purpose of this decision the cutoff grade for the surface ores at the time of withdrawal is used. The cutoff grade was determined using the following formula: mining and processing costs (as determined by Hendrickson) divided by the product of the rate of recovery and the price of gold, to wit: $7.46/($117 x 0.70).

13/ The cutoff grade was determined in the same manner as in note 11 above, to wit: $20/($117 x 0.70).

No. 5. However, this does not ineluctably lead to the conclusion that there is a valuable mineral deposit on each of the claims containing a portion of this massive quartz vein. Specifically, Judge Luoma concluded that an ore body of sufficient value to be profitably mined by heap leaching exists only on the Del Norte Fraction, Del Norte No. 5, and Inyo No. 1 claims. 14/

[2] The question before us is whether the record shows that there is mineral of sufficient quality and quantity within each of the remaining claims at issue to warrant a prudent miner's further investment of labor and means with the reasonable prospect of success in developing a paying mine. Each claim must be supported by a discovery of a valuable mineral deposit within its own boundaries. United States v. Melluzzo, 32 IBLA 46, 59 (1976), aff'd sub nom. Melluzzo v. Watt, 674 F.2d 819 (9th Cir. 1982). The sine qua non of such discovery is an exposure of a valuable mineral deposit on a claim. United States v. Weber Oil Co., 68 IBLA 37, 43, 89 I.D. 538, 540-41 (1982). The existence of valuable minerals on a claim, based solely on geologic inference, cannot serve as a predicate for a finding of quantity and quality sufficient to support a discovery on that claim. United States v. Feezor, 74 IBLA 56, 85, 90 I.D. 262, 278 (1983).

Within the area of the Del Norte group of claims, the testimony distinguished the proven reserves (red and green areas on exh. C-34) within the Del Norte Fraction, Del Norte No. 5, and Inyo No. 1 claims and an adjoining lower grade extension of the ore body (outlined in blue on exh. C-34) which was identified as "possible to probable ore." This blue block lies primarily on the Del Norte Fraction, Inyo No. 1, and Del Norte claims, but also embraces a portion of the Del Norte No. 5 and a small portion of the Del Norte No. 3 claims. The vast majority of the sampling data revealing sufficient gold and silver values within the Del Norte group relates to the main ore body; while there had been some sampling within the blue-colored area, the sampling within this block was not nearly as thorough as that conducted within the red and green areas.

In their statement of reasons, appellants state that their post-trial memorandum sets forth the basis of the validity of the claims at issue. However, review of that document reveals that the analysis of the tonnage and grade of the gold and silver is, for the most part, couched in terms of the Del Norte group, the main ore body and, to a lesser extent, the secondary ore body. See Post-trial brief at 24-38. As we have said before, it is not enough to offer evidence simply for the claims as a unit. United States v. Cactus Mines Limited, supra; United States v. Bunkowski, 5 IBLA 102, 121, 79 I.D. 43, 52 (1972). In addition, although appellants' expert witnesses consistently testified that, based on the prudent man rule, they would develop other claims in addition to the Del Norte Fraction, Del Norte No. 5, and Inyo No. 1 claims (II Tr. 69, 729-31, 1026-27), those opinions must be supported by actual evidence showing a discovery.

We have thoroughly reviewed the record to determine whether there is any evidence supporting a finding that a valuable mineral deposit has been

14/ Kappes estimated that the proper ore body on the three claims (red and green zones, Exh. C-34) contained 210,000 tons, broken down as approximately 120,000 tons on Del Norte No. 5; 60,000 tons on the Del Norte Fraction and 40,000 tons on the Inyo No. 1 (II Tr. 960).

exposed on the Del Norte, Del Norte No. 3, Inyo Lode, and Inyo No. 2 claims and exists in such quantity to support a discovery. 15/ At the outset, we note Hendrickson's testimony that there was no sampling data outside the boundary of the secondary ore body outlined in blue on Exh. C-34, although we note that shaft Q on the Inyo No. 2 claim sampled in 1974 and some of the OME drill holes are outside of the secondary ore body (II Tr. 586). Hendrickson also admitted that the portion of the vein on the Del Norte No. 3 claim had not been tested (II Tr. 730).

The record contains assay results from two splits of samples taken by Hendrickson from shafts on the Del Norte group, including shaft L on the Del Norte claim and shaft Q on the Inyo No. 2 claim. Hendrickson and NPS separately had these samples assayed. For shaft L, the assay results ranged from none to 0.005 ounces of gold per ton and none to 0.2 ounces of silver per ton. The results for shaft Q showed the same range. See I Tr. 373-76; Exhs. G-9, G-10, G-45. 16/

The majority of the samples taken during the drilling under the OME loan program were from the Del Norte Fraction, Del Norte No. 5, and Inyo No. 1 claims. No drill holes were made on the Del Norte No. 3 and Inyo No. 2 claims under this program. Three sample holes (Nos. 2, 49, and 50) were drilled on the Inyo lode claim with negligible results. See Exhs. G-1, G-25. Six samples from drill cuttings (Nos. 25, 27, 28, 30, 31, and 51) were taken on the Del Norte claim. The fire assays performed on these samples again showed negligible results, although additional assays for some samples using a cyanide method showed higher values for drill holes No. 30 and 31. The results as reported in the Geological Survey's Final Field Report on OME Project 6827, dated June 8, 1972 (see Exh. G-1), were as follows:

	Hole No.	Depth (quartz)	Depth sampled (composite)	Gold - oz/ton Fire	Gold - oz/ton Cyanide	Silver - oz/ton Fire	Silver - oz/ton Cyanide
	2	40	30	Tr.	0.18		
	*	*	*	*	*	*	*
	25	35	35	0.02	0.01	0.03	0.06
"		0-10	0.08		0.09		

15/ Except as previously noted, appellants do not seek validity determinations as to the Del Norte No. 2, Del Norte No. 4, or Inyo No. 3 claims and there is no evidence of record to support a discovery on these claims. See notes 5, 6, supra.

16/ Appellants assert that samples taken by Dr. Cooke from the stoped area on the Inyo No. 2 claim showed a very high grade, averaging 0.5 ounces of gold per ton. See Post-trial brief at 93, note. However, we are unable to find any evidence in the record relating specific samples taken by Dr. Cooke from this claim to assay results establishing the claimed value. See II Tr. 27-29, 68-69, 416-21, 426-32. But see II Tr. 801-02. In addition, although Kappes testified that there is high-grade ore in the stopes on the Inyo No. 2 (II Tr. 1032), he apparently did not sample there.

*	*	*	*	*	*	*
27	40	30	Tr.	0.03	0.02	0.13
28	40	30	Tr.	0.01	0.02	0.34
*	*	*	*	*	*	*
30	35	35	Tr.	0.43	0.07	0.98
31	40	35	0.02	0.16	0.07	0.37
*	*	*	*	*	*	*
49	40	35	Tr.		0.06	
50	35	30	0.01		0.05	
51	45	40	0.01		0.14	

[Emphasis in original.]

We recognize that the OME report, the Government witnesses and appellants' witnesses considered the OME-sponsored samples to have been flawed because of the use of poor sampling techniques, resulting in assays which are lower than that which could be expected. See I Tr. 367, 395; II Tr. 28-29, 36, 43, 64. An examination of the assay results from samples subsequently taken on the Inyo No. 1, Del Norte Fraction, and Del Norte No. 5 claims supports the determination that the OME samples are generally lower than the less questionable samples taken from the same general area. However, the only assay data used in calculating the blue block reserves on the Del Norte claim was that for samples taken under the OME-sponsored program. Based on these samples, Hendrickson calculated an ore zone indicating the existence of a total of 180,000 tons of mineralization containing an average of 0.056 ounces of gold per ton (II Tr. 585, 611).

In addition, contestees' witness Kappes testified that in his opinion the blue block contained commercial grade ore on the Del Norte claim which could be developed and mined profitably when mining the red zone (II Tr. 961, 1026). The cyanide assays for drill holes Nos. 30 and 31 (graphic, supra) demonstrate that pockets of commercial ore are present in the blue zone. See also II Tr. 934. It is important to realize that the blue zone is merely an extension of the mineralization found in the red block. It is not a separate ore body, but merely a delineation of a portion of the mineralized zone in which sufficient sampling was conducted to determine the existence of mineralization but for which there has not been sufficient sampling to delineate a proven ore body. On the record presented, the primary difference between the blocks is merely the number of samples taken and not a change in the tenor of the mineralization. We find that appellants have demonstrated the existence of mineralization on the Del Norte claim sufficient to conclude that there is a reasonable expectation that a paying mine can be developed on the claim. This evidence overcomes the prima facie case that was presented by the Government.

We cannot, however, draw the same conclusion with respect to the Inyo, Inyo No. 2, and Del Norte No. 3 claims. While the use of geologic inference

cannot be used to establish the existence of a mineral deposit, it can be used to show the extent of the deposit. The claimant must be able to demonstrate two important physical facts in order to utilize geologic inference. The first is the existence of mineralization on the claim of sufficient quality to warrant development of a mine. The second requirement is structural evidence on the claim which would justify the inference of a known ore body of sufficient quantity to justify a prudent man in expending labor and means with a reasonable prospect of success in developing a paying mine. See United States v. Feezor, supra at 78-81, 90 I.D. at 274-76, and cases cited therein. There is no doubt that the geologic structure in the Del Norte group is either exposed or can be reasonably projected to be in the Inyo, Inyo No. 2, and Del Norte No. 3 claims. However, there is nothing of record which would allow the Board to conclude that the structure contains an ore body on those claims. For example, appellants have submitted no assays of samples taken from the Del Norte No. 3 claim and there is no evidence of the existence of mineralization on this claim. The maps indicate that one shaft was sampled on the Inyo No. 2 claim. However, the record does not disclose the results of the assay of the sample taken from this claim, and we must conclude that if the sample indicated the existence of mineralization above the cutoff grade, the claimant would have identified this sample. The results of two assays of samples taken from the Inyo claim disclosed nominal mineralization. No further samples from this claim were introduced by either appellants or the Government. Based on the evidence before us, we find no basis for a conclusion that there is an ore body on the Del Norte No. 3, Inyo, or Inyo No. 2 mining claims which would justify the expenditure of labor and means with a reasonable expectation of developing a profitable mine.

As to the claims at issue in the Skidoo group, viz., Silver Ball, Silver Ball No. 1, Silver Ball No. 2, Silver Ball No. 5, Silver Ball No. 7, Silver Ball No. 8, Silver Ball No. 9, Silver Ball No. 10, and the Silver Ball No. 11 claims, Judge Luoma concluded that blocks of ore totaling 21,000 tons at a grade of 0.3 ounces of gold per ton could reasonably be inferred from the sampling data, but that such quantity would not justify the costs of extraction and refining. As previously noted, appellants argue that by using the same analysis as used by Judge Luoma in calculating the value of the ore on the Del Norte group, it can be calculated that the value of the gold recoverable on the Skidoo claims at the time of withdrawal would be $24.57 per ton based on an average grade of 0.3 ounces of gold and a cyanidation recovery rate of 70 percent at a price of $117 an ounce (II Tr. 616-17). 17/ Since the cost of mining, crushing, and leaching this ore in 1976 was about $20 per ton, according to Hendrickson (II Tr. 616), 18/ appellants contend that a high-grade mining operation and heap leaching of these claims is clearly economically feasible, especially when the value of silver recovered is added to the return.

The record actually shows that the estimate of 21,000 tons of "proven" ore with an average value of 0.3 ounces of gold per ton relates only to the Silver Ball No. 9 and Silver Ball No. 10 claims (II Tr. 574, 617).

17/ See note 12.

18/ See also testimony of Donald Fife, II Tr. 841, and Kappes, II Tr. 1000-1008, as corrected by post-trial affidavit dated June 16, 1980.

Hendrickson testified that 2,400 to 2,500 tons of the ore exist on the Silver Ball No. 9 lode claim, and that the remainder of the "proven ore" is located on the Silver Ball No. 10 lode claim (II Tr. 617). The assay report and maps submitted by appellants for the Skidoo group relate primarily to the Silver Ball No. 10 claim. See II Tr. 482-88, Exhs. C-25 through C-30. Based on his sampling, Hendrickson blocked out "ore in place" on the Silver Ball Nos. 9 and 10 claims. See II Tr. 577; Exh. C-34-F. Hendrickson estimated that there are 20,000 additional tons of ore in place in the Silver Ball No. 7 claim, but because he no longer has all of the sample results from the claim, he was not sure of the average grade (II Tr. 618). He commented, however, that he believed the grade to be similar if not better than the material on the other claims in the Skidoo group (II Tr. 618).

Exh. C-16 introduced by appellant Coso is a comprehensive composite map of the underground workings on these claims as they existed in 1935. 19/ The map was examined by Government witness Zentner and he agreed that the assay results shown on the map in the area of the samples taken by him were similar to those he had received (II Tr. 302-06). During cross-examination of Zentner, Judge Luoma stated that he would not accept any of the figures on the map unless the person taking the samples testified (II Tr. 306-07).

Appellants, however, did not rely on the figures on Exh. C-16. As Judge Luoma stated at page 7:

> The contestees also conducted an extensive sampling program on some of the Skidoo claims. They began a systematic mapping and sampling program of the existing underground and surface workings on these claims. They surveyed various drifts, crosscuts and adits and made reconnaissance notes on the exposed veins, and then systematically sampled the veins, and these samples were fire assayed. In those areas which showed favorable results, additional sampling was done on five foot centers to more specifically determine the grade and tonnage in those areas. In excess of 200 samples were collected. (II Tr. 478-479). 20/

The results of the sampling by contestees and Exh. C-16 support appellants' contention of the existence of a valuable mineral deposit on the Silver Ball No. 7, Silver Ball No. 9, and Silver Ball No. 10 claims. We find no such evidence with respect to the Silver Ball, Silver Ball No. 1, Silver

19/ A possible conflict exists with respect to the location of the claims by reason of the placement of the underground workings on the various exhibits. Note location of Silver Ball No. 2 and 10 claims as shown on Exhs. C-1 and C-34 versus C-16. The Board's determination is based upon the placement of the underground workings as depicted on Exhs. C-1 and C-34.

20/ We note that the results of contestees' efforts corroborate the accuracy of various assay figures on Exh. C-16 and even though Judge Luona apparently accorded no weight to those figures, we find that the results of contestees' independent sampling would lead a prudent man to accept the balance of the corresponding data as being accurate and representative. That data serves as additional evidence of the existence of a valuable mineral deposit on the Silver Ball Nos. 7, 9, and 10 claims.

Ball No. 2, Silver Ball No. 5, Silver Ball No. 8, or Silver Ball No. 11 claims.

Based on the foregoing, we conclude that there has been no showing of a valuable mineral on the Silver Ball, Silver Ball No. 1, Silver Ball No. 2, Silver Ball No. 5, Silver Ball No. 8, or Silver Ball No. 11 claims such that a prudent person would be justified in the expenditure of his labor and means with a reasonable prospect of success in the mining of these claims. With respect to the Silver Ball No. 7, Silver Ball No. 9, and Silver Ball No. 10 claims, appellants have shown that mineralization exists there which is suitable for heap leaching and contains value high enough to return the costs of extraction and produce a profit. We also conclude that there is a reasonable expectation that more ore will be developed through orderly operation of the mine. Appellants presented sufficient evidence to preponderate over the Government's prima facie case as to these claims. See United States v. Cactus Mines Limited, supra at 32-33 n.2 (1984) (concurring opinion of Judge Mullen). Therefore, we reverse Judge Luoma's decision to the extent he found the Silver Ball No. 7, Silver Ball No. 9, and Silver Ball No. 10 claims invalid.

Pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the decision of Administrative Law Judge Luoma is affirmed in part and reversed in part. 21/

Wm. Philip Horton
Chief Administrative Judge

We concur:

Bruce R. Harris
Administrative Judge

R. W. Mullen
Administrative Judge

21/ In this case Judge Luoma was acting pursuant to the statutory directive in the Mining in the Parks Act to determine the validity of any unpatented mining claims within the Death Valley National Monument. 16 U.S.C. § 1605 (1982). Thus, he found certain claims valid and others invalid. We note, however, that under ordinary circumstances, absent a patent application, where the contestee preponderates on the issues raised by the evidence, the contest complaint is dismissed, and such dismissal does not establish the validity of the claim. United States v. Hooker, supra at 27; see also United States v. Cactus Mines Limited, supra.